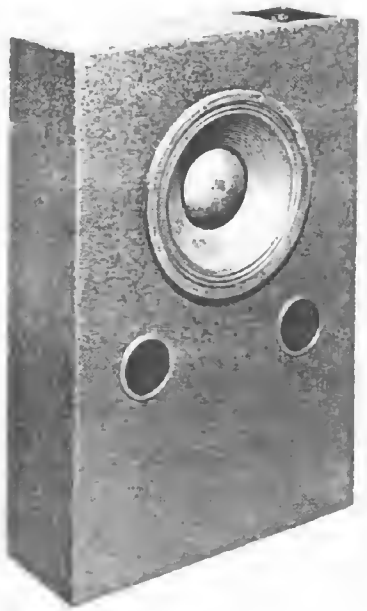
Electro-Voice®



# TL15-1XS

## Low-Frequency Speaker System

- Ultrathin depth of 254 mm (10.0 in.) overall allows for installation in very tight areas
- THX® approved for cinema applications[1]
- 38-Hz low end for rich bass
- Top-mounted input panel permits mounting flush against a wall
- EVX-150A 381-mm (15-in.) woofer for trouble-free operation
- Black texture-painted finish

1 THX is a registered trademark of Lucasfilm Ltd

### SPECIFICATIONS

**Typical Axial Frequency Response, Swept Sine Wave, 4 volts at 3.05 meters (10 feet), anechoic environment, normalized for 1 watt at 1 meter into woofer (see Figure 1):**
38-2,000 Hz

**Low-Frequency 3-dB-Down Point:**
38 Hz

**Usable Low-Frequency Limit (10-dB-down point):**
30 Hz

**Efficiency:**
4.3%

**Long-Term Average Power-Handling Capacity per EIA RS-426-A 1980 (see Power Handling section):**
600 watts

**Sensitivity (SPL at 1 watt, 1 meter input, anechoic environment, swept sine wave):**
96 dB

**Dispersion Angle Included by 6-dB-Down Points on Polar Responses, Indicated One-Third-Octave Bands of Pink Noise (see Figure 3),**
**40-125 Hz, Horizontal and Vertical:**
360°
**125-2,000 Hz, Horizontal and Vertical:**
105° ± 55°

**Directivity Factor $R_\theta$ (Q), Median over Indicated Range (see Figure 4),**
**40-125 Hz:**
1.7
**125-2,000 Hz:**
6.0

**Directivity Index $D_i$ (10 $\log_{10}$ R), Median over Indicated Range (see Figure 4),**
**40-125 Hz:**
2.2 dB
**125-2,000 Hz:**
6.6 dB

**Distortion, 0.1 Full Power Input, (see Figure 5),**
**Second Harmonic,**
**100 Hz:**
2.1%
**1,000 Hz:**
2.2%
**Third Harmonic,**
**100 Hz:**
0.9%
**1,000 Hz:**
0.2%

**Transducer Complement:**
One EVX-150A 381-mm (15-in.) woofer

**Net Box Volume:**
133 liters (4.7 $ft^3$)

**Box Tuning Frequency:**
40 Hz

**Impedance (see Figure 6),**
**Nominal:**
8.0 ohms
**Minimum:**
6.3 ohms

**Input Connections:**
Screw terminals (#10) on barrier strip

**Enclosure Materials and Finish:**
Black texture-painted 19-mm (0.75-in.) void-free plywood

**Enclosure Dimensions,**
**Height:**
1.004 m (39.50 in.)
**Width:**
680 mm (26.75 in.)
**Depth:**
254 mm (10.00 in.)

**Net Weight:**
35.4 kg (78 lb)

**Shipping Weight:**
39.0 kg (86 lb)

### DESCRIPTION

The Electro-Voice TL15-1XS is a member of the TL series of low-frequency enclosures. The TL15-1XS is a direct-radiating vented design that provides high efficiency, low distortion and very good low-frequency performance in a very compact enclosure. The TL15-1XS employs a single EVX-150A 381-mm (15-in.) loudspeaker in a 133-liter (4.7-$ft^3$) enclosure.

The TL15-1XS has two features which allow for positioning in tight areas that are not possible with traditional low-frequency designs. The thin, 10.0-inch depth combined with the top-mounted input panel means the enclosure can be pushed against the wall. One such place where this can be used to its advantage is behind screens in small movie theatres.

The TL15-1XS's 38-Hz low-frequency 3-dB-down point makes it appropriate for both voice and music playback and sound reinforcement.

The enclosure is made from plywood and finished with black textured paint. Connections are made via barrier strip (#10) recessed into the top of the enclosure on a durable molded connector panel.

### FREQUENCY RESPONSE

The TL15-1XS's axial frequency response was measured in Electro-Voice's large anechoic chamber at a distance of 3.05 meters (10 feet) with a swept sine-wave input of 4 volts. Figure 1 has been averaged and normalized for 1 watt at 1 meter.

### DIRECTIVITY

The directional characteristics of the TL15-XS were measured in Electro-Voice's large anechoic chamber. The test signal was one-third-octave filtered pink noise at the frequencies indicated. A full spherical measurement system was used. All directional information

## TL15-1XS SPECIFICATION GRAPHICS

FIGURE 1 — TL15-1XS Axial Frequency Response
(anechoic environment, 1 watt/1 meter)

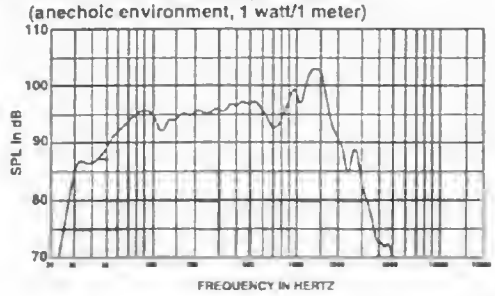



FIGURE 2 — TL15-1XS One-Third Octave Polar Responses
(anechoic environment, 4 volts/6.10 meters (20 feet))

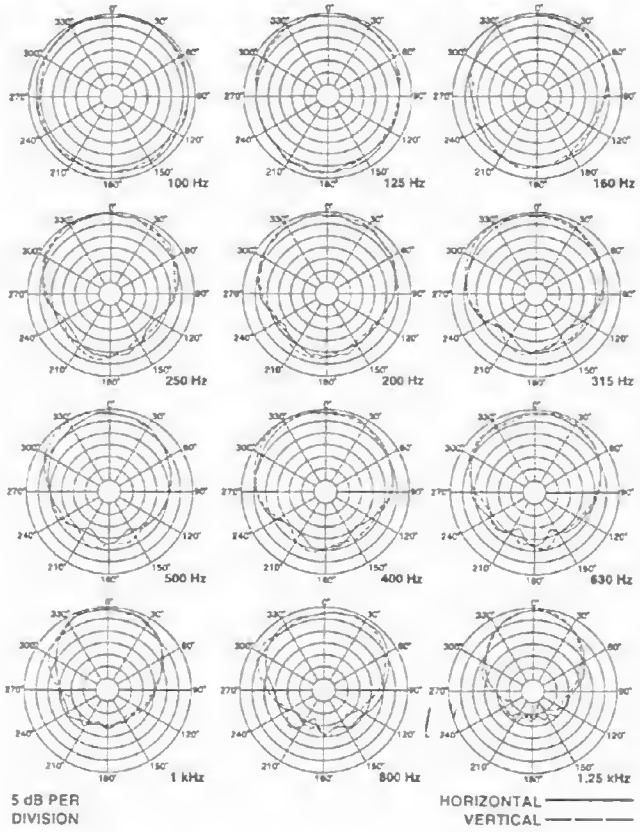



FIGURE 3 — TL15-1XS Beamwidth Response
(anechoic environment, 4 volts/6.10 meters (20 feet))

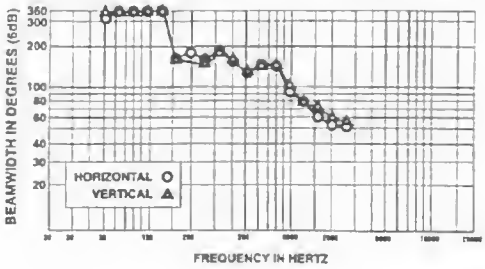



FIGURE 4 — TL15-1XS Directivity Response
(anechoic environment, 4 volts/6.10 meters (20 feet))

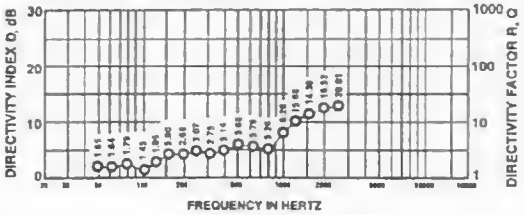



FIGURE 5 — TL15-1XS Harmonic Distortion, 0.1 Rated Power Input
(60 watts), 3.05 meters (10 feet) on Axis

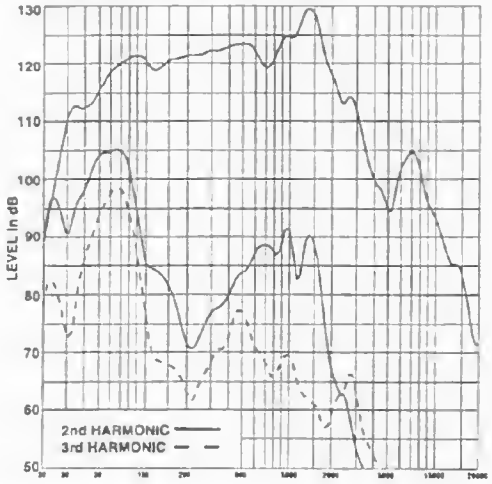
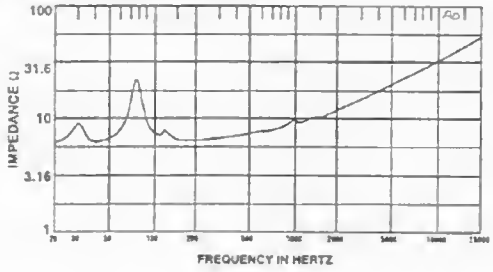



FIGURE 6 — TL15-1XS Impedance Curve



was measured at 6.10 meters (20 feet).

Figure 2 illustrates the horizontal and vertical polar responses.

Figure 3 shows the horizontal and vertical beamwidths. Beamwidth is the angle at which the horizontal and vertical polar responses have decreased in level by 6 dB when compared to the axial frequency response.

Figure 4 illustrates the total directivity of the TL15-1XS. The directivity factor $R_\theta$ (Q) is the ratio of the SPL of the TL15-1XS at a given point to the SPL of an ideal omnidirectional source at that same point. The directivity index, $D_i$, is calculated by $D_i = 10 \log_{10} R$.

## POWER HANDLING

Electro-Voice components and systems are manufactured to exacting standards, ensuring they will hold up, not only through the most rigorous of power tests, but also through continued use in arduous, real-life conditions. The EIA Loudspeaker Power Rating Full Range (EIA RS-426-A 1980) uses a noise spectrum which mimics typical music and tests the thermal and mechanical capabilities of the components. Electro-Voice will support relevant additional standards as and when they become available. Extreme, in-house power tests, which push the performance boundaries of the woofers, are also performed and passed to ensure years of trouble-free service.

Specifically, the TL15-1XS passes EIA RS-426-A 1980 with the following values:

$R_{SR}$ = 5.75 ohms (1.15 x $R_E$)

$P_{E:MAX)}$ = 600 watts

Test voltage = 58.7 volts rms,
117.5 volts peak

The "peak" power-handling capacity of a woofer is determined by the peak test voltage amount. For the TL15-1XS, a 117.5-volt peak test voltage translates into 2,400-watts short-term peak power-handling capacity. This is the equivalent of four times the "average" power-handling capacity, and is a peak that can be sustained for only a few milliseconds. However, this sort of short-duration peak is very typical in speech and music. Provided the amplifier can reproduce the signal accurately, without clipping, the woofer will also perform accurately and reliably, even at these levels.

## AMPLIFIER POWER RECOMMENDATIONS

As noted in the Power-Handling section above, the TL15-1XS has a random-noise power capacity of 600 watts long term (2,400 watts peak) per EIA RS-426-A 1980. The following guidelines will help relate this to an appropriate power amplifier output rating.

1. To use the TL15-1XS to full capacity, skilled experts in sound-system installation and operation will obtain the best results if the power amplifier is 2.0 to 4.0 times the long-term average noise power rating of the speaker system. For the TL15-1XS, this is 1,200 to 2,400 watts.

The caution cannot be made strongly enough, however, that this arrangement is only for experts or those who can discipline themselves against "pushing" the system for ever-higher sound levels and who can avoid "accidents" such as catastrophic feedback or dropped microphones.

2. A more conservative, "normal" amplifier size, which will produce audible results nearly equal to those of the "expert" recommendation, is 1.0 to 1.4 times the long-term average noise power rating of the speaker. For the TL15-1XS, this is 600 to 840 watts.

3. To be very conservative, one can use an amplifier rated at 0.5 to 0.7 times the long-term average noise power rating of the loudspeaker. For the TL15-1XS, this is 300 to 420 watts.

Request P.A. Bible Addition No. Two ("Power-Handling Capacity") for more background on these recommendations.

## SUBPASSBAND SPEAKER PROTECTION

Below the enclosure tuning frequency, cone excursion increases rapidly. Since acoustic output is also falling, there is no utility in driving the system with signals much below tuning frequency. While such signals may be in the program material, they are often extraneous, such as a dropped microphone. Therefore, it is recommended to use a filter for below the bassband, which is 38 Hz. The Electro-Voice Dx34, EX-24, XEQ-2, and XEQ-3 electronic crossover/equalizers can provide this subpassband protection. The 3-dB-down point is user-controlled on the Dx34, 30 Hz on the EX-24 and XEQ-2, and 16 Hz or 32 Hz on the XEQ-3.

Other high-pass filters are available and 1/3-octave filters can also be effective at providing the required protection.

## SUSPENDING TL15-1XS ENCLOSURES

The TL15-1XS is designed for typical cinema stage (behind-the-screen) applications where subwoofers are mounted on the stage floor. **The TL15-1XS is not designed to be self-suspended from above, and if suspended, must be supported and hung in a way which does not depend on the structure of the TL15-1XS itself for support.**

## ENCLOSURE CONSTRUCTION

The TL15-1XS is ruggedly constructed of 19-mm (0.75-inch) void-free plywood. The cabinet is braced to reduce panel resonances. It is finished with black texture paint.

## SERVICE

In the unlikely event the TL15-1XS requires service, the woofer can be replaced or serviced from the front. A service data sheet is available from Electro-Voice.

## ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The loudspeaker system shall be a low-frequency bass-reflex design. A 381-mm (15-in.) woofer shall be front mounted in a 133-liter (4.7-ft³) enclosure. The woofer shall be an Electro-Voice EVX-150A with a long-term noise power capacity of 600 watts per EIA RS-426-A 1980. The system will meet the following criteria: axial frequency response from 38 to 2,000 Hz; sensitivity of 96 dB at 1 watt/1 meter; impedance of 8 ohms nominal and 6.3 ohms minimal; dispersion of 130° x 140° at 500 Hz. The system shall be capable of producing average sound levels in excess of 123 dB in the long term, and short-term peaks of 129 dB.

The black texture-painted enclosure shall be constructed of braced 19-mm (0.75-in.) plywood. The enclosure shall contain sound-absorbing glass wool. The connections shall be #10 screw terminals on barrier strip. The dimensions shall be 1.004 m (39.50 in.) tall, 680 mm (26.75 in.) wide, and 254 mm (10.00 in.) deep. Net weight shall be 35.4 kg (78 lb).

The loudspeaker system shall be the Electro-Voice TL15-1XS.

## UNIFORM LIMITED WARRANTY

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

**Electro-Voice Speakers and Speaker Systems** are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Electro-Voice active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.